

**METHOD AND APPARATUS FOR CALCULATING BIT  
LOG-LIKELIHOOD RATIOS FOR QAM SIGNALS**

**ABSTRACT OF THE DISCLOSURE**

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A method and apparatus to efficiently calculate log-likelihood ratios for each bit within M-ary QAM modulated symbols transmitted in a communication system. The method and apparatus utilize characteristics of square Karnaugh mapping of the QAM symbol constellation in order to reduce the number of distance calculations  
10 needed to determine the log-likelihood ratios for each of the bits within a demodulated symbol. The reduction in the number of calculations affords significant reduction in the time needed to determine log-likelihood ratios, especially for higher order M-ary QAM systems.